The day school is a technical college, and provides extended courses in mechanical and electrical engineering, chemistry, natural sciences, and for the Arts and Science degrees of London University. The evening school provides courses in all science subjects, with practical trade classes in building, engineering, printing and chemical trades; languages, commercial subjects, and women's work. The staff of the school is composed as follows:—Principal, C. H. Draper, B.A., D.Sc.; chemistry, M. C. Clutterbuck, B.Sc., Ph.D.; natural science, H. Edmonds, B.Sc.; engineering, G. Armstrong, M.Sc. The total cost of buildings and equipment will be about 25,000*l.*

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—Mr. W. Ridgeway has been re-elected Disney Professor of Archæology.

Mr. Yule Oldham, University Lecturer in Geography, lectures this term on the Geography of Central Europe, and on Physical Geography, on Mondays and Thursdays respectively. He is also giving an extension course in the town on the Great Explorers, which is largely attended.

Sir Ernest Clarke, Gilbey Lecturer, gives his second series of lectures on Agricultural History and Economics on Thursdays during February, at noon, in St. John's College.

Mr. Osbert Salvin, F.R.S., and Mr. Ainger, Master of the Temple, have been elected to Honorary Fellowships at Trinity Hall.

MR. JOHN D. ROCKEFELLER has just given the Chicago University 200,000 dols., this being in addition to many previous gifts.

THE following are among recent appointments:—Dr. Julius Istvánffy to be professor of botany at Klausenburg; Dr. Alexander Mágócsy-Dietz to be assistant professor of botany at Budapest; and Prof. Dr. Zacharias to be director of the Botanic Garden at Hamburg.

THE Finance Committee of the Corporation have recently reported on the application of the Council of the City and Guilds of London Institute for a renewal of the grant from the Corporation to the funds of the institute. They state from inquiry that the work of the institute has been successfully and economically managed, and the results achieved are fully commensurate with the expenditure involved. The Corporation have, in consequence of this report, voted 400*l.* in respect of last year towards the funds of the institute, to be devoted to the Finsbury Technical College.

A COPY of the Calendar of the University College of Sheffield has been received. It will be remembered that the present College was constituted by Royal Charter last May, and was formed by the amalgamation of three pre-existing institutions—the Firth College, the Sheffield Technical School, and the Sheffield School of Medicine. These institutions had previously worked hand in hand, although under independent governing bodies. By the charter they were merged into one corporation with a single Court of Governors. The new Calendar shows that the College is doing valuable work by providing the people of Sheffield and the district with the means of higher scientific and literary education by University methods of teaching.

AT a meeting of Convocation of the University of London on Monday, the report of the special committee appointed to consider the Commission Bill was adopted. After a discussion the following resolution, recommended by the special committee and moved by Dr. J. B. Benson, was carried, an amendment to it being rejected by seventy-six votes to forty-two: "That this House accepts the scheme embodied in the London University Commission Bill, 1897." The special feature of the resolution adopted rests upon the fact that it was supported by one of the sections that had always hitherto opposed the Cowper scheme. The opponents belong to two classes: the no change—that is, the two Universities section, who are still irreconcileable, and the section which favoured procedure by charter, and not by statutory commission. It was this section that was mainly responsible for the compromise embodied in the Bill of last year—a compromise which has been accepted by all the bodies concerned, and which Convocation has now approved.

THE annual general meeting of the Incorporated Association of Head Masters was held on Thursday last. Resolutions were passed referring to the new regulations of the matriculation examination of the University of London, the dates of scholarship examinations at Oxford and Cambridge, and the training of teachers. At the second day's meeting of the Association, this year's president, the Rev. A. R. Vardy, Head Master of King Edward's School, Birmingham, delivered an address in which he referred to some of the more important educational work accomplished by the Association during the past year. The Rev. R. D. Swallow, in moving "That this Association approves the steps taken by its representatives at the Delimitation Conference held at the Education Department, and hereby adopts the joint memorandum as agreed to at the conference," remarked that the conference, though under the chairmanship of Sir G. Kekewich, was unofficial. It was understood by all that State aid would be needed by secondary schools if they were to take their proper place. The great aim recognised in the memorandum was that the object of secondary schools was to form character in its fullest sense. As to application of principles, the masters of higher grade schools had acknowledged that there must be differentiation. The higher grade schools accepted a place as definitely higher primary schools. These schools had also accepted the assignment of scholarships to primary and secondary schools, and claimed no exclusive use of public funds. The Association also accepted the position that, being primary, these higher grade schools should also be free. There was also a common agreement as to a central authority. After some discussion, the resolution was adopted. A resolution was also carried to the effect that Parliamentary assistance was needed both for the cost of annual maintenance and the provision and equipment of adequate buildings for secondary education.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, December 16, 1897.—"On the Thermal Conductivities of Single and Mixed Solids and Liquids, and their Variation with Temperature." By Dr. Charles H. Lees, Assistant Lecturer in Physics in the Owens College.

These experiments were undertaken with a view to determining the effect of temperature on thermal conductivities, and the relation between the conductivity of a mixture and the conductivities of its constituents. About thirty solids, liquids, substances near their melting points, and mixtures of liquids, were tested between temperatures of 15° and 50° C., and the following statements embody the results:—

(1) Solids not very good conductors of heat in general decrease in conductivity with increase of temperature in the neighbourhood of 40° C. Glass is an exception to this rule.

(2) Liquids follow the same law in the neighbourhood of 30° C.

(3) The conductivity of a substance does not invariably change abruptly at the melting point.

(4) The thermal conductivity of a mixture lies between the conductivities of its constituents, but is not a linear function of its composition.

(5) Mixtures of liquids decrease in conductivity with increase of temperature in the neighbourhood of 30° C., at about the same rate as their constituents.

"On the Biology of *Stereum hirsutum*, Fr." By H. Marshal Ward, Sc.D., F.R.S., Professor of Botany in the University of Cambridge.

The author has cultivated the mycelium of this fungus obtained from spores, on sterilised wood, and after several months the cultures developed yellow bosses which proved to be the hymenophores bearing the basidia. This fungus has not hitherto been made to produce spores in cultures, and Basidiomycetes generally have rarely been made to do so. The actions of the mycelium on the wood of *Æsculus*, *Pinus*, *Quercus*, and *Salix* are also examined, and this is, so far as known, the first time this has been done with pure cultures.

Mathematical Society, January 13.—Prof. Elliott, F.R.S., President, in the chair.—The President informed the Members of the recent decease of Signor Brioschi, a Foreign Member of the Society, gave a slight sketch of some of his work, and dwelt upon the loss occasioned by his death to the mathematical world. He then read a letter drawing attention to what was proposed to be done in founding a "Sylvester-Memorial" medal, to be awarded triennially by the Royal Society.—Mr. Love, F.R.S., communicated a paper, by Mr. B. Hopkinson, on discontinuous fluid motion; and Mr. S. H. Burbury, F.R.S., gave a sketch of his paper on the general theory of stationary motion in a system of molecules.—The following papers were briefly communicated from the chair:—Note on a property of Pfaffians, Mr. H. F. Baker; on the intersections of two conics of a given type, and on the intersections of two cubics, Mr. H. M. Taylor; on the continuous group defined by any given group of finite order, Prof. W. Burnside, F.R.S.; on those transformations of coordinates which lead to new solutions of Laplace's equation, Prof. Forsyth, F.R.S.—Mr. G. B. Mathews, F.R.S., exhibited copies of a figure connected with Prof. F. Morley's paper (on the Poncelet polygons of a Limaçon, November 11, 1897).

Edinburgh.

Royal Society, December 20, 1897.—The Hon. Lord McLaren in the chair.—Dr. C. G. Knott read an obituary notice of the Rev. John Wilson.—Dr. Noël Paton communicated the result of a series of investigations on the life-history of salmon in fresh water. The work was carried on in the Research Laboratory of the Royal College of Surgeons, Edinburgh, for the Scottish Fishery Board, and the results will be embodied in a report to that Society. The following are the names of those responsible for the different parts of the investigation: Drs. F. D. Boyd, J. C. Dunlop, A. L. Gillespie, E. D. W. Greig, G. L. Gulland, Mr. S. C. Mahalanobis, Miss M. J. Newbigin, and Dr. Noël Paton. The objects of inquiry were: To determine whether salmon feed in fresh water; to investigate the factors causing the migrations of the salmon from sea to river, and river to sea; to study the cause of the migrations, and to investigate the chemical changes of the salmon in fresh water. With regard to the first question—Do salmon feed in fresh water?—it is shown that, in fish which have been in fresh water, changes occur in the mucous membrane of the alimentary canal, the cells undergoing degeneration, and desquamation. The digestive activity is feeble; there is a greater number of micro-organisms found in the stomach and intestines, and the proportion of putrefactive organisms is greater. This last may be accounted for by the absence of acid connected with the low digestive power. As to the second and third points of inquiry—the cause and course of migration—the changes in the weight and condition of salmon, from the estuaries and upper reaches, have been studied during the season. There is evidence that migration is not caused by the *nisus* generations but by the state of nutrition. The chemical changes which take place in salmon are interesting. There is a disappearance of solids from the muscles, which is far more than sufficient to yield the solids required by the growing ovaries and testes, and the disappearance of fat from the muscles is more than sufficient to yield the fat of the ovaries. The muscles do not undergo fatty degeneration, but fat is stored between the fibres and in the fibres, and afterwards discharged or used up. The fats are the most important source of the energy of muscular work. The "curd" is due to an excess of soluble proteids, which diminish in the muscles as the season advances. The proteid lost from the muscle is far more than sufficient to yield the proteid of the ovary and testis. The phosphorus stored in the muscles is just sufficient to yield the phosphorus of the growing ovary, but the iron stored in the muscle is not sufficient to yield the iron of the ovaries. Changes in the food value of the fish, and the nature of the pigments in the flesh and ovary are also subjects of investigation.—A note on the passage of water and other substances through india-rubber films, by Dr. R. A. Lundie, was communicated by Prof. Tait.

Paris.

Academy of Sciences, January 10.—M. A. Chatin delivered the presidential address, in which, after some remarks on botanical classification, he gave brief accounts of the work of members and associates lost by death during the past year, MM. D'Abbadie, Des Cloizeaux, and Schützenberger. The prizes for the year 1897 were awarded as follows:—Francœur Prize, for Geometry, to M. G. Robin; the Poncelet Prize, to M. R. Liouville, for his work on mathematics and mechanics. In Mechanics, the Extraordinary Prize of six thousand francs, between MM. Gossot, Liouville, Decante, and Chéron; the Montyon Prize between MM. Bourguin, Pavie, and Pigache; and an encouragement from the funds of the Plumey Prize to MM. Brillé and Girard. The Fourneyron Prize, on the theory of the motion of bicycles, was not awarded. In Astronomy, the Lalande Prize to M. Perrine for his discoveries of comets; the Damoiseau Prize to M. Hermann Struve; and the Valz Prize to M. Louis Fabry. In Physics, the La Caze Prize to M. Ph. Lénard for his researches on the kathode ray. In Statistics, a Montyon Prize is divided between M. Gustave Bienaymé and MM. Vincent and Burot; a very honourable mention being accorded to M. Lepage and an honourable mention to M. Baudran. In Chemistry, the La Caze Prize to M. Sabatier for his researches on the sulphides of the alkalis and alkaline earths, of boron and of silicon, on the thermochemistry of the hydrated metallic chlorides, on metaphosphoric and nitrosodisulphonic acids, and on the action of the oxides of nitrogen upon metals; the Jecker Prize to M. Haller for his researches in organic chemistry, especially on the derivatives of camphor. In Mineralogy and Geology, the Grand Prize for the Physical Sciences to M. Joseph Vallot for his researches on the meteorology and geology of the High Alps and Pyrenees; the Bordin Prize to M. G. Pruvot for his works on the depth and fauna of the Gulf of Lyons, and the Delesse Prize to M. Œhlert for his paleontological work. In Botany, the Desmazières Prize to M. Jacob Eriksson for his researches on the mode of life and propagation of the numerous forms of blight which attack cultivated graminaceous plants; the Montagne Prize to M. Bourquelot for his work on the physiology of fungi, and the Thore Prize between M. Louis Bordas and M. Sappin-Trouffy. In Anatomy and Zoology, the Savigny and the Da Gama Machado Prizes are not awarded, but honourable mention is accorded to the work of Mdme. la Comtesse de Linden. In Medicine and Surgery, Montyon Prizes are awarded to M. Gaucher for his memoirs on the pathogeny of nephritis and on the diseases of the skin; to M. Zambaco for his work on leprosy in Constantinople; to MM. Rémy and Contremoulins for their Atlas of Radiophotography; and to MM. Marie and Ribout for their radiographic work. Mentions are accorded to M. Fabre-Domergue, MM. Bosc and Vedel, and a third mention to M. Lapique; the Barbier Prize is given to M. de Rochebrune for his treatise on African toxicology, and a mention to M. Lucet for his memoire on *Aspergillus fumigatus* in domestic animals and in incubating eggs; the Bréant Prize to MM. Burot and Legrand for their works on marine epidemics and on mortality in the Colonial army; the Godard Prize to MM. Beauregard and Boulart for their researches on the genito-urinary organs of the Cetacea; the Parkin Prize to Dr. Augustus Waller for his studies relating to the action of carbonic acid and other gases upon the negative variation of excited nerves; the Bellion Prize between M. Auguste Pettit for his researches on the suprarenal capsules, and M. Peron for his anatomical and experimental researches on the tuberculosis of the pleura; the Mège Prize to M. Ph. Tissié; the Lallemand Prize between M. Henri Meunier for his study of the part played by the nervous system in infection of the pulmonary apparatus and M. Gustave Durante for his work on secondary degenerations of the nervous system. Honourable mentions are accorded to M. Voisin, MM. Onuf and Collins, and to M. A. Mercier. The Baron Larrey Prize is awarded to M. Auffret for his monographs on the help to be given to the wounded and shipwrecked in maritime war. In Physiology, the Montyon Prize for experimental physiology is given to M. Delzenne for his works on the coagulation of the blood, the La Caze Prize to M. Röntgen for the discovery of a new and powerful instrument of physiological and therapeutical research; the Pourat Prize to M. Kaufmann; the Martin Damourette Prize to M. L. Guinard for his memoirs on the physiological effects of some of the opium alkaloids, and on the causes of certain accidents in anæsthesia, and the Philipeaux Prize to MM. Courtade and Guyon. In Physical Geography, the Gay Prize is accorded to M. Charles Flahault for his memoir on the study of the French Mediterranean region from the point of view of the geographical distribution of plants. Of the General Prizes, the Montyon Prize (unhealthy trades) is not awarded this year, but mentions are accorded to MM. Masure, Arnaud, and Magitot. The Cuvier Prize is given to Prof. Marsh for his geological work in the United States; the Trémont Prize to M. Frémont; the Gegner Prize to M. Paul Serret; the Petit D'Ormoy Prizes to the late M. Tisserand (Mathematical Sciences); and M. Gosselot (Natural Sciences); the Tchiatcheff Prize to M. Obrutschew; the Gaston Planté Prize to M. André Blondel; the Cahours

Prize between MM. Lebeau, Hébert, Tassilly, and Thomas; the Saintour Prize to M. G. André; the Prize founded by Mdme. La Marquise De Laplace to M. Crussard, and the Prize founded by M. Félix Rivot to MM. Crussard, Gourguechon, Bertrand, and Bruneau.

NEW SOUTH WALES.

Royal Society, November 3, 1897.—The President, Henry Deane, in the chair.—The effect of temperature on the tensile and compressive properties of copper, by Prof. Warren and Mr. S. H. Barraclough. This investigation was carried out on some fifty copper test pieces. The temperature range attained was from 25° F. to 535° F., the temperatures being measured by certified mercurial thermometers. The chief conclusions arrived at were: (*a*) The relation between the ultimate tensile strength and the temperature may be very closely represented by the equation $f = 32{,}000 - 21\ t$, where f is the tensile strength expressed in pounds per square inch, and t is the temperature expressed in degrees F. (*b*) Temperature does not affect the elongation or contraction of area in any regular manner: and at any one temperature the variation in these two quantities is so variable for different specimens that no particular percentage could be included in a specification for the supply of copper. (*c*) The elastic limit in tension occurs at about 5400 lbs. per square inch: this limit probably decreases rapidly with increase of temperature, but the differences in the behaviour of individual specimens are so great as to prevent the determination of the relationship between the two quantities. (*d*) The elastic limit in compression occurs at about 3200 lbs. per square inch: it decreases with increase of temperature, the relationship between the two being more regular than in the tensile tests. (*e*) The rate of permanent extension and compression increases rapidly with increase of temperature.—Aurora Australis, by H. C. Russell, C.M.G., F.R.S. This paper contained a list of auroral displays in the southern hemisphere during 1897, also a detailed account of one which was observed by the captain and officers of the R.M.S. *Aorangi*, on April 20, 1897, when the ship was in long. 96° W. and lat. 47½° S.—The basalts of Bathurst and the neighbouring districts, by W. J. Clunies Ross. In this paper the character of the basalt occurring in the neighbourhood of Bathurst, on the Bald Hills, and other hills in the vicinity, was described. Specimens from various localities have been obtained, microscopic sections cut from them, and chemical analysis made. It has been found that there are some differences in the microscopic structure of the rocks from hills close together, but the chemical analysis shows them to be all closely related. The silica was found to be about 47 per cent., but reached 50 per cent. on Mount Pleasant. The alumina, oxide of iron, lime, and magnesia were also determined. For comparison with the Bathurst basalt, which no doubt originally flowed as a lava from some centre of volcanic activity, and in order to trace the source from which it came, specimens were examined from all the places within forty miles of Bathurst, where basalts are known to occur.

DIARY OF SOCIETIES.

THURSDAY JANUARY 20.

ROYAL SOCIETY, at 4.30.—The Relations between Marine Animal and Vegetable Life: H. M. Vernon.—(1) The Homogeneity of Helium; (2) Fergusonite, an Endothermic Mineral: Prof. W. Ramsay, F.R.S., and Morris W. Travers.—On the Modifications of the Spectra of Iron and other Substances radiating in a Strong Magnetic Field: T. Preston.

ROYAL INSTITUTION, at 3.—The Halogen Group of Elements: Prof. Dewar, F.R.S.

SOCIETY OF ARTS, at 4.30.—Recreations of an Indian Official: Right Hon. Sir Mountstuart Elphinstone Grant Duff, G.C.S.I., C.I.E., F.R.S.

LINNEAN SOCIETY, at 8.—On the Larval Hyobranchial Skeleton of the Anurous Batrachians, with special reference to the Axial Parts: Dr. W. G. Ridewood.—On the "Abdominal Pore" in the Myxinidæ: R. H. Burne.

CHEMICAL SOCIETY at 8.—Ballot for the Election of Foreign Members.—The Action of Caustic Alkalies on Amides: Dr. Julius B. Cohen and Edward Brittain.—The Formation of Monomethylaniline from Dimethylaniline: Dr. Julius B. Cohen and H. T. Calvert.—Note on the Aluminium-Mercury Couple: Dr. Julius B. Cohen and H. T. Calvert.—Action of Chloroform and Alkaline Hydroxides on the Nitro-benzoic Acids: W. J. Elliott.—Researches on the Terpenes. II. On the Oxidation of Fenchene: J. Addyman Gardner and G. B. Cockburn.—The Preparation of Pure Iodine: Dr. Bevan Lean and W. H. Whatmough.

FRIDAY, JANUARY 21.

ROYAL INSTITUTION, at 9.—Buds and Stipules: Sir John Lubbock, Bart., M.P.

PHYSICAL SOCIETY, at 5.—On Electric Signalling without Conducting Wires: Prof. O. Lodge, F.R.S.—A Tesla Oscillator will be exhibited by Prof. S. P. Thompson, F.R.S.

TUESDAY, JANUARY 25.

ROYAL INSTITUTION, at 3.—The Simplest Living Things: Prof. E. Ray Lankester, F.R.S.

ANTHROPOLOGICAL INSTITUTE, at 8.30.—Anniversary Meeting.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Reservoirs with High Earthen Dams in Western India: W. L. Strange.

ROYAL VICTORIA HALL, at 8.30.—Mars as a World: R. A. Gregory.

THURSDAY, JANUARY 27.

ROYAL SOCIETY, at 4.30.

ROYAL INSTITUTION, at 3.—The Halogen Group of Elements: Prof. J. Dewar, F.R.S

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Notes on the Electro-Chemical Treatment of Ores containing the Precious Metals: Major-General Webber, C.B.

FRIDAY, JANUARY 28.

ROYAL INSTITUTION, at 9.—Instinct and Intelligence in Animals: Prof. C. Lloyd Morgan.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Condensing Apparatus: H. Williams.

BOOKS RECEIVED.

BOOKS.—The Tutorial Chemistry: Dr. G. H. Bailey. Part 2. Metals (Clive).—On a Sunshine Holyday: The Amateur Angler (Low).—Nature's Diary: F. H. Allen (Gay).—An Elementary Course of Practical Organic Chemistry: F. C. Garrett and A. Harden (Longmans).—The Essentials of Experimental Physiology: Dr. T. G. Brodie (Longmans).—Premature Burial: Fact or Fiction?: Dr. D. Walsh (Baillière).—The Tailless Batrachians of Europe: G. A. Boulenger, Part 1 (Ray Society).—A First Year's Course of Experimental Work in Chemistry: Dr. E. H. Cook (Arnold).—Views on some of the Phenomena of Nature: J. Walker (Sonnenschein).—Korea and her Neighbours: Mrs. Bishop, 2 Vols. (Murray).—United States Geological Survey, Monographs xxv.-xxviii (Washington).—Annuaire de l'Académie Royale des Sciences, &c., de Belgique, 1898 (Bruxelles).—The Purification of Sewage and Water: W. J. Dibdin (Sanitary Publishing Company, Ltd.).—Proceedings of the Chemical and Metallurgical Society of South Africa, Vol. 1 (Edinburgh, Hunter).—Audubon and his Journals: M. R. Audubon, 2 Vols. (Scribner).—The Observer's Atlas of the Heavens: W. Peck (Gall).—The War of the Worlds: H. G. Wells (Heinemann).

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